

structure. In claim 38, the reinforcing structure includes a resin composition of discontinuous fibers arbitrarily dispersed in an epoxy.

With respect to claims 1 and 38, and their dependent claims, applicant respectfully requests reconsideration and withdrawal of this rejection because Healey does not disclose the subject matter of independent claims 1 and 38. In particular, Healey does not disclose a pre-formed tubular support structure and a reinforcing structure formed over the pre-formed tubular support structure.

Healey relates to an electric fuse having a laminated casing formed of multiple layers of resin-impregnated glass cloth. See Abstract. In particular, three plies 6a, 6b, and 6c, of a woven glass fiber fabric material are sandwiched together and then impregnated with a thermosetting resin to integrate the three plies into a single tubular laminate to form the case. See column 6, line 22 to column 8, line 19. The casing is formed by a pultrusion process in which all layers of the laminate are folded on a mandrel and then infused with resin. See FIG. 15 and col. 11:33 - col. 12:39. Thus, all layers of the laminated casing are formed and integrated together, see col. 6:27-29 ("Casing 6 further includes a thermosetting resin integrating plies 6a, 6b, 6c into a tubular laminate."), and thus Healey does not disclose a pre-formed tubular support structure over which a fiber matrix reinforcing structure is formed.

In the instant Office action, the Office asserts that plies 6a and 6b are identical to the claimed preformed tubular support structure and that ply 6c is identical to the claimed reinforcing structure. Office action at page 2. The applicant respectfully requests reconsideration because plies 6a and 6b are not a preformed tubular support structure. This is particularly evident because for the plies 6a, 6b, and 6c, to be formed into a casing, they must be laid over an inner mandrel D2 of a die that is used to define the shape of the casing. However, the plies 6a and 6b by themselves do not form a tubular support structure until after they have been integrated with ply 6c and cured. Thus, even when plies 6a, 6b, and 6c have been formed into a rigid structure, there is no pre-formed tubular support structure over which a fiber matrix reinforcing structure is formed. Rather, there is only a single structure in which the plies 6a, 6b, and 6c are integrated.

The Office asserts that the recitation in claim 1 that the tubular support structure is pre-formed holds no patentable weight because the pre-formed nature of the support structure allegedly relates only to the process by which the structure is made and not its structure. However, such arguments by the Office to deny patentability have long ago been rejected by the courts. For example, in In re Garnero, 412 F.3d 276 (CCPA 1969), an inventor sought a patent for a thermal insulation panel formed from expanded perlite particles. The inventor claimed “a thermal insulation panel . . . consisting essentially of expanded perlite particles which are interbonded one to another by interfusion between the surfaces of the perlite particles while in a pyroplastic state to form a porous perlite panel.” Id. at 277. The Office rejected the claim because it read the language “expanded perlite particles which are interbonded one to another by interfusion” as reciting a mere process limitation. Id. at 278-79. The CCPA rejected this argument and held that the disputed language recited a structural limitation. The Court noted that this language was similar to other language that had been held to be structural, such as, “intermixed,” “ground in place,” “press fitted,” “etched,” and “welded.” Id. at 279.

Here, the claim language, “pre-formed tubular support structure,” is structural in the same sense that the claim language in Garnero was held to be structural. In particular, the language of claims 1 and 38 requires a preformed tubular support structure, which distinguishes the invention recited in claims 1 and 38 structurally from the apparatus disclosed in Healey. Whereas in Healey, a die is required to form the three plies 6a, 6b, and 6c into a single casing, claims 1 and 38 require that a reinforcing structure is formed over a separate preformed tubular support structure. Thus, in one implementation, “the support structure 125 prevents the reinforcing structure 130 from collapsing before being hardened in a curing operation. The reinforcing structure 130 is formed over the support structure 125 and is in direct physical contact with a portion of the electrical assembly 105, such as an outside surface of an electrical contact 110. Because the support structure 125 is merely providing a mechanical support around which the reinforcing structure 130 is applied, the support structure 125 may be relatively thin and need not have any additional preparation, such as a centerless ground surface to receive the electrical contacts 110.” Application at pages 5 - 6.

The Office relies on In re Thorpe, 777 F.2d 695 (Fed. Cir. 1995) to support its rejection; however, Thorpe is inapposite. The invention at issue in Thorpe related to color developers used in carbonless copy paper systems. Thorpe discovered a novel process for making the color developer, and the Office allowed Thorpe's claims to the novel process. However, Thorpe also sought product-by-process claims, such as "44. The product of the process of Claim 1." id. at 696, and the Office rejected these claims. The Federal Circuit upheld the rejection because the Office established a prima facie case of unpatentability and because Thorpe did "not assert that the product of his process is different from the product of the prior art."

Independent claims 1 and 38 of the present application, however, do not claim a product-by-process, and the applicant does assert that his product is structurally different from the prior art. Therefore, Thorpe's holding is not pertinent to the question of the patentability of the present claims. Rather, according to the controlling authority of Garnero, the "pre-formed tubular support structure" language in claims 1 and 38 is structural, and this language distinguishes claims 1 and 38 from Healey.

For at least these reasons, applicant requests withdrawal of the rejections of claims 1 and 38. Claims 2-4, 6-11, 14, 16, 17, and 22-24 depend from claim 1 and are allowable for at least the reasons that claim 1 is allowable. Claim 39 depends from claim 38 and is allowable for at least the same reasons that claim 38 is allowable.

Independent claim 25 recites a method of reinforcing a fuse, including providing an electrical assembly that includes two electrical contacts accessible from an exterior of a fuse and a fuse element in contact with the two electrical contacts, surrounding at least a portion of the electrical assembly by a pre-formed tubular support structure, and applying a reinforcing structure over the pre-formed tubular support structure and in contact with at least a portion of the electrical assembly, where the reinforcing structure comprises a fiber matrix, the fiber matrix comprising fibers pre-impregnated with a resin.

As explained above, Healey does not disclose applying a reinforcing structure over a pre-formed tubular support structure. Rather, Healey discloses, in FIG. 15 and at col. 11:33 – col. 12:39, pultruding a multilayer laminate and infusing the laminate with resin to form a fuse

casing. Thus, Healey does not disclose any preformed tubular support structure, nor does Healey disclose applying a reinforcing structure over the pre-formed tubular support structure. For at least this reason, applicant requests reconsideration and withdrawal of the rejection of claim 25. Claims 27-29, 31-33, and 37 depend from claim 25 and are allowable for at least the reasons that claim 25 is allowable.

### **35 U.S.C. § 103 Healey/Tobin Rejection**

Dependent claim 5 has been rejected as allegedly obvious over Healey in view of U.S. Patent No. 4,349,803 ("Tobin"). Applicant requests withdrawal of this rejection because Tobin does not cure the deficiencies of Healey.

Tobin relates to a weather resistant fuse tube having an inner portion, and outer portion, and a reinforcing material (e.g., fiberglass cloth, mat, or spirally wound strands). See col. 4:1-9. To make the fuse tube, a cylinder of reinforcing material is placed in a mold, and material is introduced into the mold from inside the cylinder to form the inner portion of the tube and from outside the cylinder to form the outer portion of the tube. Material from inside and from outside the reinforcing material cylinder flows through the reinforcing material so that material inside the cylinder bonds with material outside the cylinder, such that the inner portion and outer portion bond together to form a continuum. See col. 4:24-35; see also col. 3:2-10.

Thus, Tobin does not disclose a pre-formed tubular support structure over which a reinforcing structure is formed, as recited in claims 1 and 38, and Tobin does not disclose applying a reinforcing structure over a pre-formed tubular support structure, as recited in claim 25. Rather, Tobin discloses injecting fluid material into a mold containing a reinforcing material, such that a tube is molded that includes the reinforcing material within the molded tube.

Thus, Tobin does not cure the deficiencies of Healey with respect to independent claim 1. Because claim 5 depends from claim 1, claim 5 is allowable for at least the reasons that claim 1 is allowable.

### **35 U.S.C. § 103 Healey/Schmunk Rejection**

Claims 12, 13, and 26 have been rejected as allegedly obvious over Healey in view of U.S. Patent No. 4,028,656 ("Schmunk"). Applicant requests withdrawal of this rejection because Schmunk does not cure the deficiencies of Healey.

Schmunk relates to a high-voltage fuse with an out heat-shrinkable sleeve. See Abstract. However, Schmunk does not describe a fuse tube assembly that includes a pre-formed tubular support structure and a reinforcing structure formed over the pre-formed tubular support structure and in contact with at least a portion of the electrical assembly.

Thus, Schmunk does not cure the deficiencies of Healey with respect to independent claim 1. Because claims 12, 13, and 26 depend from claim 1, claims 12, 13, and 26 are allowable for at least the reasons that claim 1 is allowable.

### **35 U.S.C. § 103 Healey/Schmunk/Pearce Rejection**

Claim 15 has been rejected as allegedly obvious over Healey in view of Schmunk and in further view of U.S. Patent No. 5,261,980 ("Pearce"). Applicant requests withdrawal of this rejection because Pearce does not cure the deficiencies of Healey and Schmunk.

Pearce relates to a method of manufacturing fiber-reinforced composite materials (e.g., for use as ski poles, spars for hang gliders, rocket launch tubes, etc.) Col. 1: 6-17. However, Pearce does not describe a fuse tube assembly that includes a pre-formed tubular support structure and a reinforcing structure formed over the pre-formed tubular support structure and in contact with at least a portion of the electrical assembly.

Thus, Pearce does not cure the deficiencies of Healey and Schmunk with respect to independent claim 1. Because claim 15 depends from claim 1, claim 15 is allowable for at least the reasons that claim 1 is allowable.

### **35 U.S.C. § 103 Healey Rejection**

Claims 18-21, 30, and 34-36 have been rejected as allegedly obvious over Healey. Applicant requests withdrawal of this rejection and allowance of dependent claims 18-21, 30,

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and 34-36 because, as explained above, Healey does not disclose all the elements of independent claims 1 and 25, from which these claims depend.

No fees are believed to be due at this time. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 08215-539001.

Respectfully submitted,

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